



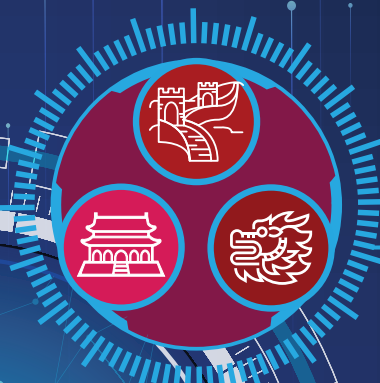
HONG KONG
ICT AWARDS
2024 香港資訊及
通訊科技獎

Student Innovation Award 學生創新獎

提升資訊素養
Enhancing
Information
Literacy



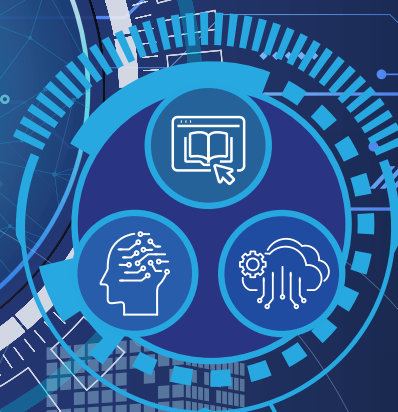
培養國家情懷
Cultivating
Nationalism



改善社會問題
Solving Social
Issues



提升學習成效
Enhancing
Learning



促進身心健康
Promoting
Wellness



AI

Leading Organisation
籌辦機構

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CHAN Chung Hong Meris

香港培正中學
陳頌康

Occupational safety guard

職安保鑢

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Bronze Award 銅獎

St. Teresa Secondary School
LO Sing Yui Sanaa / CHAN Ching Yan / CHAN Yee Nam /
CHENG Sze Wing

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勞星蕊 / 陳靖恩 / 陳依楠 / 鄭思穎

Gondola safety system

銅舟共存

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Diocesan Girls' School
SO Hei Ching / TANG Long Yan Valerie / LIN Ching Kiu

拔萃女書院
蘇熙晴 / 鄧朗欣 / 連靖翹

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HKFYG Lee Shau Kee Primary School
CHEUNG Sum Wing / LIU Ka Yi / MIU Cheuk Yiu / HO Ching Yu

香港青年協會李兆基小學
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IP Tze Huen / TANG Cheuk Chun / WONG Sum Laam / CHAN Yu Ching

僑港伍氏宗親會伍時暢紀念學校
葉梓萱 / 鄧焯駿 / 黃心嵐 / 陳宇晴

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Certificate of Merit 優異證書

C.&M.A. Chui Chak Lam Memorial School
TANG Hei Yin / SHEK Yee Shuen Scarlett / CHAN Man Chun /
WONG Lok Sum

基督教宣道會徐澤林紀念小學
鄧浠妍 / 石鈺璇 / 陳文縉 / 黃樂心

Good Partner

築君安好

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Gold Award 金獎

ELCHK Lutheran Secondary School
MOCHIZUKI Ken

基督教香港信義會信義中學
望月謙

A-EYE AI visual impaired
shopping assistant

人工智能視障人士購物助理

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Silver Award 銀獎

Diocesan Girls' School
TSANG Evelyn Wai Ning / CHAN Tsz Nam / LAU Sin Sze Zoe /
WANG Cindy Hing Yu

拔萃女書院
曾慧寧 / 陳芷楠 / 劉善思 / 王馨宇

DGS Metaverse

拔萃女書院教育元宇宙

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Certificate of Merit 優異證書

CNEC Christian College
TSUI Chi Tang

中華傳道會安柱中學
徐志騰

Certificate of Merit 優異證書

Independent Schools Foundation Academy
SUN Yuqi / LAU Kan Kenneth

Melbourne Grammer School
Richard XU

弘立書院
孫宇琦 / 劉勲

Melbourne Grammer School
許達宇

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Gold Award 金獎

Hong Kong Institute of Information Technology,
Institute of Vocational Education (Sha Tin)
TSANG Shun Tin / HO Lok Yin / HO Cheuk Hin / CHAN Ka Wing

香港資訊科技學院位於香港專業教育學院（沙田）
曾順天 / 何樂言 / 何卓軒 / 陳嘉穎

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Hong Kong University of Science and Technology
LEE Cheuk Sum / SO Ho Mang Marcus / WONG Ho Leong

香港科技大學
李焯森 / 蘇顯萌 / 黃皓亮

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YEUNG Kwan Yu / SADMAN Sakib Rabbani

香港理工大學
楊鈞羽 / SADMAN Sakib Rabbani

PayPilot Group Limited

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Certificate of Merit 優異證書

The Hong Kong University of Science and Technology
CHEUNG Pok To Jason
The University of Hong Kong
CHAN Matthew / NIGAM Kaustubh / ABRAHAM Jose Christian

香港科技大學

張博滔

香港大學

陳柏衡 / NIGAM Kaustubh / ABRAHAM Jose Christian

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Student Innovation Award 學生創新獎



Background 背景

The Hong Kong ICT Awards (HKICTA) aims at recognising and promoting outstanding information and communications technology (ICT) inventions and applications, thereby encouraging innovation and excellence among Hong Kong's ICT talent and enterprises in their constant pursuit of creative and better solutions to meet business and social needs.

The HKICTA was established in 2006 with the collaborative efforts of the industry, academia and the Government. Organised by the Digital Policy Office, and led by Hong Kong ICT industry associations and professional bodies, the Awards aims at building a locally espoused and internationally acclaimed brand of ICT awards.

There are eight categories under the HKICTA 2024. There is one Grand Award in each category, and an "Award of the Year" is selected from the eight Grand Awards by the Grand Judging Panel. In addition, in a bid to foster the innovative use of artificial intelligence (AI), each of the eight categories has established a new distinguished accolade: the "Best Use of AI" award, magnifying and honouring outstanding achievements in harnessing the power of AI in respective areas.

EdCity is officially appointed by DPO to be the Leading Organiser of the Hong Kong ICT Awards 2024: Student Innovation Award. The Student Innovation Award covers 4 streams, including Primary, Junior Secondary, Senior Secondary and Higher Education. By drawing on innovative strategies and best practices, EdCity hopes to drive innovation within the awards, fostering an environment that encourages students to push boundaries and think outside the box, and ultimately advance the ICT Industry.

香港資訊及通訊科技獎旨在表揚及推廣優秀的資訊及通訊科技發明和應用，以鼓勵香港業界精英和企業不斷追求創新和卓越，謀求更佳和更具創意的方案，滿足企業的營運需要，造福社會。

通過業界、學術界和政府的共同努力，香港資訊及通訊科技獎於二零零六年成立。香港資訊及通訊科技獎由數字政策辦公室舉辦，並由香港業界組織及專業團體籌辦，目的是為香港建立一個廣受香港社會愛戴、並獲國際認同的資訊及通訊科技專業獎項。

2024香港資訊及通訊科技獎設有八個獎項類別。每個類別均設有一個大獎，而最終評審委員會再從八個大獎中甄選出「全年大獎」。此外，為了激發更多人工智能的創新應用，每個獎項類別都增設一個嶄新獎項：「最佳人工智能應用」獎，以彰顯並表揚那些在相關範疇應用人工智能方面取得傑出成就的參賽作品。

教城獲數字政策辦公室正式委任為2024香港資訊及通訊科技獎：學生創新獎的籌辦機構。學生創新獎涵蓋小學、初中、高中、大專及高等教育四個組別。通過採用創新策略和最佳作業方式，教城期望推動獎項的創新，營造一個鼓勵學生突破界限、跳出框架的環境，最終推進ICT行業的發展。

Message from Executive Director of Leading Organiser 籌辦機構行政總監獻辭



Mr Ken Ngai
Executive Director, Hong Kong Education City

魏遠強先生
香港教育城行政總監

Technology education is a crucial component of the educational development policies in Hong Kong and across the nation, serving as a key driver for technological advancement and social progress.

Hong Kong Education City (EdCity) has consistently kept pace with the times, dedicated to promoting and integrating electronic teaching, and providing comprehensive support for teachers, students, and parents. Technology education is an important part of the educational development policies. In response to the national strategy of fostering science and technology, and to nurture scientific and technological talents, EdCity actively organised the 2024 Hong Kong ICT Awards: Student Innovation Award. This initiative includes a series of themed training workshops aimed at enhancing students' knowledge and boosting their confidence. Furthermore, social elements have been incorporated into the competition themes to heighten students' awareness of social development. EdCity hopes to make good use of this platform to cultivate innovative thinking among students and to continuously advance the development of talent in innovation and technology.

This year's Student Innovation Award has showcased an impressive catalogue of diverse and high-calibre entries, many of which reflect a strong sense of social responsibility among the participants. Among hundreds of submissions, numerous projects have sought to address existing societal issues through innovative technology. The products and initiatives span various fields including healthcare, social inclusion, environmental protection, industrial safety, transportation, education, and finance. Many entries have moved beyond theoretical concepts to practical applications. Notable examples include new systems utilising artificial intelligence to reduce medical errors, as well as innovative devices or software designed to provide accessible services for individuals with disabilities. Particularly

科技教育是香港以至國家教育發展政策的重要一環，是促進科技進步和社會發展的關鍵。

香港教育城（教城）一直以來與時並進，致力提倡和推廣電子教學並推廣科技的融合，為老師、學生、家長提供多方面的發展支援。科技教育是國家教育發展政策的重要一環，為響應科教興國的教育策略，促進培育科技人才，教城積極籌辦2024香港資訊及通訊科技獎：學生創新獎，活動中舉辦了多場主題培訓工作坊，增進學生知識及提升自信，更將社會元素融入比賽主題，以提升學生對社會發展的關注。教城冀能善用這個平台，培養更多學生的創新思維，持續推進創科人才的發展。

縱觀本屆學生創新獎，參賽者的作品展現出驚人的多樣性和高水準，其中不乏深懷社會責任感的學生。在數百份參賽作品中，不少是通過創新科技解決社會上存在的問題，產品和項目涵蓋醫療、社會共融、環保、工業安全、交通、教育、金融等多個領域，許多作品不再停留在理論層面，而是可投入到實際應用中。當中既有利用人工智能減少醫療失誤的新系統，亦有關顧弱勢社群，通過創新設備或軟件為殘疾人士提供無障礙服務等的構想。特別一提的是，大專組的參賽者比往年更加踴躍，可見年輕一代對創新科技的熱情不斷提升，一顆顆科技界前途無限的新星正在冉冉升起。

noteworthy is the increased enthusiasm from participants in the higher education category compared to previous years, indicating a growing passion for innovative technology among the younger generation. A new generation of stars in the tech field is undoubtedly on the rise.

The success of this competition would not have been possible without the invaluable support from our co-organisations and various supporting organisations throughout the preparation process, enabling greater student participation while providing us with precious insights and resources. We also extend our heartfelt gratitude to the Chief Judge Dr Hubert Chung Yee CHAN, JP and all the judges for their diligent efforts in meticulously reviewing each submission, helping students progress with their hard work. Lastly, we express our special thanks to the Digital Policy Office for their trust and support towards EdCity.

EdCity will continue to fulfil its mission with unwavering commitment to creating an inspiring educational environment, collaborating with all sectors to nurture the future pillars of society. Innovation embodies the spirit of exploration into the unknown and perseverance in moving forward. We hope that all participants will continue to refine their creations, and to not cease their efforts with the conclusion of this competition, and to persist in contributing to the advancement of innovation and technology. We also look forward to future iterations of the Student Innovation Award reaching new heights, allowing more students to showcase their talents while fostering an atmosphere rich in innovation throughout academia, planting seeds of creativity in every corner of life!

是次比賽的成功，教城衷心感謝協辦及各支持機構在籌備過程中的協助，讓更多學生能夠參與本次賽事，並為我們提供了寶貴的意見及資源；同時感謝首席評審陳重義博士及一眾評審的貢獻，他們不辭勞苦地仔細審閱每份作品，幫助學生進步，勞苦功高。最後亦特別感謝數字政策辦公室對教城的信任和支持。

教城將繼續踐行使命，不遺餘力地構建能夠啟迪思維的教育環境，與各界攜手培育社會棟樑。創新是一種勇於探索未知，砥礪前行的精神。我們期望各位參賽者能夠持續完善自己的創作，不因比賽的結束而停下腳步，為創科發展貢獻一份力量；我們也期望未來的學生創新獎能更上一層樓，讓更多學生一展所長，讓創新創科的氛圍充斥學界，讓創新的種子播撒到生活的每個角落！

Message from Chairman of Judging Panel 評審委員會主席獻辭



Dr Hubert Chung Yee CHAN, JP
Chairman & CEO, Hong Kong Communications Company Limited

陳重義博士，JP
香港通訊有限公司主席兼行政總裁

It is a great honour for me to participate in the Student Innovation Award Ceremony as the Chief Judge.

Firstly, I sincerely thank the Digital Policy Office for consistently organising the Hong Kong ICT Awards, providing crucial impetus for nurturing the next generation of tech talent. I also extend my gratitude to HKEdCity for its wholehearted support of this competition. The meticulous organisation of the EdCity has been significant in bringing many outstanding ideas to life.

I would also like to express my sincere gratitude to all the diligent judges, who not only had to read through a huge number of proposals in a tight timeframe, but also scrutinised the design concepts and practical skills of the participants during the five days interviews. In the final round, the judges listened attentively to the presentations from 12pm to 8pm to ensure that each student's work was professionally and fairly evaluated. It is worth mentioning that this year, all assessors and judges took special care to provide detailed feedback and suggestions at every stage. We hope these insights will not only encourage students but also help them expand their knowledge and perspectives, becoming more confident and composed in future competitions.

This year's participants demonstrated a consistently high standard, even surpassing the previous ones, with many impressive mature and practical works. The entrants excelled in knowledge, teamwork, communication, problem-solving, and adaptability, showcasing the potential of Hong Kong's younger generation. Many students demonstrated keen insights into societal needs and a passion for ICT, presenting ideas and innovations that truly captivated us, making it difficult to choose winners. These young students have proven that age is never a barrier to innovation and breakthroughs, we can make remarkable achievements if we think out of the box and believe in ourselves.

大家好，非常榮幸能夠以首席評審的身份，參與學生創新獎的頒獎典禮。

首先，我要誠摯地感謝數字政策辦公室多年來持續舉行香港資訊及創新科技獎，為培養新一代科技人才提供了關鍵的推動力。我也要感謝香港教育城對這次比賽的傾力支持。我們能在這裏看到多優秀創意化為現實，教城的細心籌備功不可沒。

同時，我還要向所有辛勤付出的評審表達真誠的謝意，我們的評審團不僅要在緊湊的時間內仔細閱讀數量龐大的計劃書，還要在為期五日的面試中，認真審視參賽者們的設計理念和實踐能力。在最後一輪面試中，評審團由中午12點到晚上8點，始終高度專注地聆聽匯報，確保每位學生的成果都獲得專業且公正的評價。值得一提的是，今年所有評審都特別用心，在各個階段為學生細心撰寫具體的意見和建議。我們希望這些回饋不但能鼓勵學生，也可以幫助他們增長知識，開拓思考角度，在往後的其他比賽中，變得更加自信和從容。

今年的參賽者展露出一貫，甚至超越以往的高水準，很多成熟和實用的作品都令人印象深刻。各組參賽者無論是知識水平、團隊精神、表達能力、解難能力還是臨場應變能力都非常出色，讓我們看到香港年輕一代的潛力。不少學生既有敏銳的觀察力來洞察社會各界所需，亦有對資訊及通訊科技領域的熱忱，想法和創意都令人眼前一亮，我們也一時難以決定高下。年輕的學生們可以有這樣的成就，更向所有人證明了：年齡從來不是創新和突破的限制，我們只要跳出框框，相信自己，就能創造出令人驚艷的成績。

To conclude, I would like to thank the HKEdCity again for its excellent organisation of the competition and for injecting new elements into the competition to keep it innovative. Also, I would like to congratulate all the participants. I can see the infinite possibilities of the future from you, and I look forward to seeing how you can receive feedback from the judges, continue to research and improve your inventions, and ultimately become the pillars of technological innovation. I hope you will continue to pursue your dreams and fly high with the knowledge and experience you have learnt here! I look forward to seeing you all again next year! Thank you all.

最後，再次感謝香港教育城細心周詳的安排，在過往的基礎下注入新元素，讓賽事持續革新。同時，我想祝賀所有參賽同學，從你們身上我看到未來無限的可能性，我很期待你們可以接收一眾評審的意見，繼續研究，改進自己的發明，最終成為引領科技創新的中流砥柱。希望你們能帶着在這裏所學的知識和經驗，繼續勇敢追夢，展翅高飛！期待明年賽事與各位再見！謝謝大家。

Student Innovation Award Judging Panel 學生創新獎評審委員會



From Left 由左起:

Prof Chuen Sing YEUNG, JP (Esports Association of Hong Kong, China)
楊全盛教授，JP（中國香港電競總會）

Mr Man Ching, Alex HUNG, MH (Hong Kong New Emerging Technology Education Association)
洪文正先生，MH（香港新興科技教育協會）

Ms Vanessa Wai Hing YUNG (Digital Policy Office)
翁慧卿女士（數字政策辦公室）

Ms Lai Fong, Yvonne WONG (Internet Professional Association)
黃麗芳女士（互聯網專業協會）

Dr Hubert Chung Yee CHAN, JP (Hong Kong Communications Company Limited) Chief Judge
陳重義博士，JP（香港通訊有限公司）首席評審

Prof Franics Yuk Lun CHIN (The University of Hong Kong) Deputy Chief Judge
錢玉麟教授（香港大學）副首席評審

Dr Wilton Wai Tung FOK (Faculty of Engineering, The University of Hong Kong) Deputy Chief Judge
霍偉棟博士（香港大學工程學院）副首席評審

Mr Albert Kin Wai WONG (Association of I.T. Leaders in Education (AiTLE))
黃健威先生（資訊科技教育領袖協會）

Mr Anthony Kwok Chu LEUNG (Digital Vision Brands Holdings Limited)
梁國柱先生（數字願景控股有限公司）

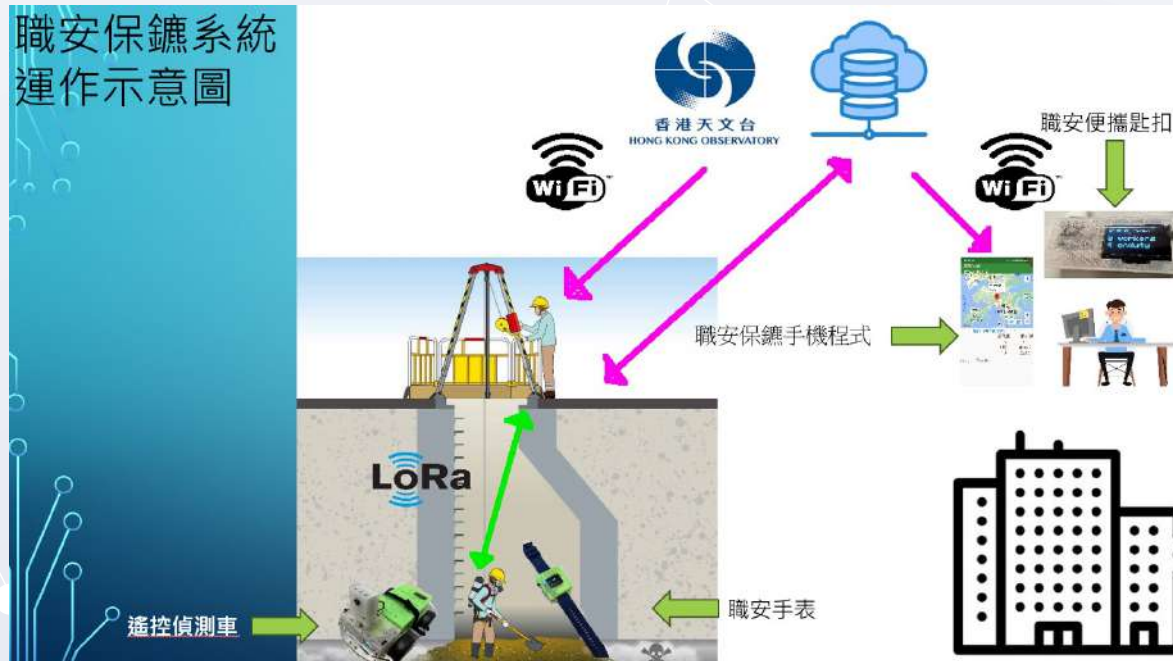
Mr Ka Tim CHU (Hong Kong Association for Computer Education)
朱嘉添先生（香港電腦教育學會）

Student Innovation (Junior Secondary)

Silver Award

學生創新 (初中) 銀獎

Pui Ching Middle School 香港培正中學
CHAN Chung Hong Meris 陳頌康



Occupational safety guard

Confined spaces are full of dangers, workers can easily get into accidents or even die in underground pipelines if they do not take proper safety measures. This invention uses a self-developed mobile app, connected to a hand meter and gas sensor via Bluetooth, to collect the user's mobile data and vital signs, and analyse data such as environmental temperature, hydrogen sulphide, carbon monoxide, methane, oxygen content, etc., which are then uploaded to the ThingSpeak website for storage. Managers can remotely monitor the location and status of workers in real time. In case of accidents, the outside world can grasp the golden rescue time to save the workers who are in danger.

Product Functions:

- Occupational Safety Watch: Built-in gyroscope to detect the user's vital signs and the user's movement status.
- Gas Sensor: Senses the level of harmful gases and oxygen content in the environment.
- Remote-controlled Detection Vehicle: Carries gas sensors, it can enter confined spaces and sends back real-time images to check various potential risks.

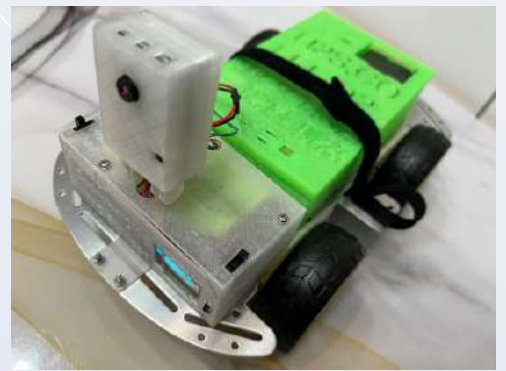
職安保鑢

密閉空間危機四伏，如果沒有做好安全措施，工人在地下管道中很容易發生意外，甚至死亡。這項發明運用自行開發的手機應用程式，透過藍牙連接手錶和氣體感測器，收集使用者移動數據及生命表徵，分析環境溫度、現場環境硫化氫、一氧化碳、甲烷、含氧量等數據，上載ThingSpeak網站儲存。管理人員可以遙距實時掌握工人的位置和狀態。遇上意外，外界能爭取黃金救援時間，營救身陷險境的工人。

產品功能：

- 職安手錶：內置陀螺儀，可探測使用者的生命體徵和使用者的移動狀態。
- 氣體感測器：感測環境中有害氣體的含量和含氧量。
- 遙控偵測車：運載氣體感應器，取代工人進入密閉空間，傳回即時影像，檢驗各種潛在風險。

- Occupational Safety Signal Soldier System: Transmits data on workers' vital signs and environmental factors in confined spaces via LoRa and uploads it to a google sheet.
- Occupational Safety Keychain: Downloads data from the Google Sheet database, displays the number of people at work, automatically analyses changes in the data, and raises alerts in case of abnormal situations.
- 職安訊號兵系統：將密閉空間內工人的生命表徵和環境因素數據，透過LoRa傳遞出密閉空間，並上傳至google sheet。
- 職安便攜匙扣：從Google Sheet 數據庫下載數據，顯示工作中的人數，自動分析數據變動，遇到異常情況就提出警示。



Comments from Judging Panel 評審委員會評語

This project aims to tackle the problem of toxic gas and communication black holes encountered in underground pipeline industry by utilising various sensors and LoRa to achieve wireless transmission. The series of supporting equipment is well-conceived and comprehensively considered, which shows that the producer has an inventor's or engineer's mindset, and it is exciting to see what the future holds for it.

這個項目針對地下管道工業意外而設，善用各類感測器及LoRa，達成無線傳輸的效果，以應對地下工作時遭遇的有毒氣體及通訊黑洞問題。一系列的配套設備構思尚算完善，能全面考慮各個層面，可見製作者具發明家或工程師思維，令人期待未來的發展。

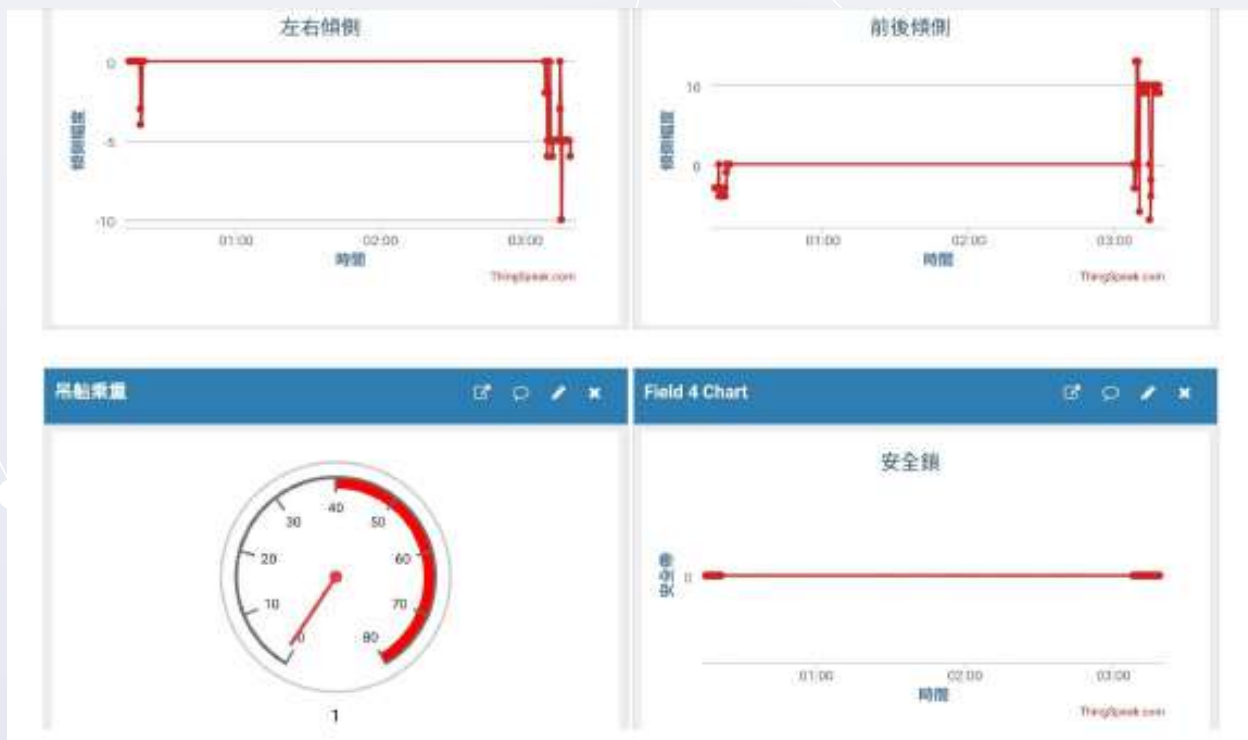
Student Innovation (Junior Secondary)

Bronze Award

學生創新 (初中) 銅獎

St. Teresa Secondary School 德蘭中學

LO Sing Yui Sanaa / CHAN Ching Yan / CHAN Yee Nam / CHENG Sze Wing
勞星蕊 / 陳靖恩 / 陳依楠 / 鄭思穎



Gondola safety system

In recent years, the number of high-altitude accidents in Hong Kong has continuously risen. Professional high-altitude gondola workers receive insufficient attention despite the frequent occurrence of accidents.

In order to enhance the information exchange between high-altitude gondola workers and ground monitors, so as to improve safety and reduce the number of accidents, this project uses the Internet of Things (IoT) device to develop a high-altitude work protection system by using the Micro:bit sensor, circuit design, and a mobile app to track the gondola worker's working condition at high altitude.

銅舟共存

近兩年香港高空工業意外的數字不斷攀升，高空吊船工人這個職業關注度不高，卻意外頻發。

為了加強高空工作環境與地面監察員的信息互通，從以提升高空工作的安全性，減少意外事故，這個方案運用物聯網裝置，以Micro:bit感測器、電路設計及流動應用程式三者配合，開發了一個高空工作保護系統，以追蹤吊船工人在高空的工作狀況。

Details:

1. The gondola is equipped with a sensory system, which detects the current load capacity of the gondola by means of the HX711 weight sensing module and load elements, which detects the inclination of the gondola by means of a Micro:bit built-in accelerator. When the tilt angle exceeds the safe range, or the weight exceeds the limit, it will stop and issue a warning.
2. The safety locking system is designed based on the principle of closed circuit, workers must fasten the safety belt to start the gondola.
3. The emergency call button provides safety protection for the gondola workers. In case of accidents, such as heat stroke or discomfort, workers can press the Micro:bit SOS button to call for support.

方案內容：

1. 吊船上設有感測系統，以HX711重量感測模組及荷重元檢測吊船目前的承重量；以Micro:bit內置加速器檢測吊船的傾斜度。當傾斜角度超出安全範圍，或重量超過限制範圍，便會緊急停止及發出警告。
2. 以閉合電路的原理設計安全鎖系統，工人必須將安全帶扣上，才能啟動吊船。
3. 緊急呼叫按鈕為吊船工人提供安全保障。當意外發生，如工人中暑或不適，可按下Micro:bit求救按鈕呼叫支援。

Comments from Judging Panel 評審委員會評語

This project addresses the frequent occurrence of accidents in the high-altitude industry and the lack of safety awareness among workers by designing a set of facilities to improve the working environment and ensure safety and stability, which are highly usable for practical application. If data analysis can be used to facilitate the actual operation of the project and to consider the various problems that may arise during the actual operation, it will certainly arouse the safety awareness of the public and the workers, and reduce the losses caused by accidents.

這個項目針對高空工業意外頻發，工人安全意識不足的問題，設計出一套改進工作環境、確保安全穩固的設施，應用實踐可用性高。若配合數據分析促進實際運作，考慮實際操作時可能出現的各項問題，想必能喚醒大眾及工人安全意識，減少因事故造成的損失。

Student Innovation (Junior Secondary) Certificate of Merit 學生創新(初中)優異證書

Diocesan Girls' School 拔萃女書院

SO Hei Ching / TANG Long Yan Valerie / LIN Ching Kiu

蘇熙晴 / 鄧朗欣 / 連靖翹



ReviveMaster

First aid knowledge can save lives in crisis and is very important to everyone. However, Hong Kong does not provide first aid courses for children under the age of 13, so this device is designed to give children an easy way to learn first aid in a short period of time.

In terms of the device's shape, the 3D printed heart-shaped shell is attached to a slingshot, which is connected to an arduino distance sensor that calculates whether the player's pressing depth is sufficiently deep enough to reach 5cm, and whether the pressing speed is between 100 and 120 times a minute. A light bar on the side of the device indicates whether the player is pressing at the correct speed and depth, allowing the player to see the feedback and make immediate improvements.

In terms of software, this device connects the arduino to the unity, and when the player presses the device, an the ambulance man on the street will be shown to stand up on the screen so as to show indicate whether the player has performed CPR correctly or not. At the end of the game, the system also scores the player's performance.

This device is small, convenient and unique. With the game, it can be a quick and easy way to educate children about first aid and popularise first aid effectively.

心肺復甦訓練裝置

急救知識可以在危急時拯救生命，對每個人都十分重要，但香港沒有為13歲以下的學童提供急救課程，所以這個裝置旨在讓兒童以輕鬆的方法，在短時間內學習急救。

裝置外形方面，3D打印出來的心形的外殼夾着彈弓，連接着arduino 的距離傳感器，計算玩家按壓深度是否足夠5厘米，按壓速度是否1分鐘100到120次。裝置旁邊配置燈條，顯示玩家是否以正確的速度和深度按壓，玩家看到回饋後可以即時作出改進。

裝置軟件方面，這項發明將arduino連接上unity，當玩家按壓裝置時，螢幕上身處街道的救護員會站起，顯示玩家是否正確地進行心肺復甦。遊戲結尾時，系統也會為玩家的表現評分。

裝置小巧方便，外型獨特，配以遊戲可以快捷地為小朋友提供急救教育，令急救有效地普及化。

Student Innovation (Primary) Gold Award 學生創新 (小學) 金獎

HKFYG Lee Shau Kee Primary School 香港青年協會李兆基小學

CHEUNG Sum Wing / LIU Ka Yi / MIU Cheuk Yiu / HO Ching Yu

張心穎 / 廖嘉兒 / 苗倬堯 / 何靖如



差唔多大概**100**多條影片

Magic App

Magic app is designed for the deaf-mute. In daily life, it is difficult for deaf-mute people to express their thoughts in a simple way, and people often cannot understand their sign language, which greatly affects the communication and commute of deaf-mute people. Therefore, this app was created to allow people who do not know sign language to understand the meaning of each sign in order to communicate with the deaf-mute people with the help of this app.

This app is programmed with Pictoblox and Google AI teachable machine. The app contains three parts: sign language teaching, sign language recognition and online Q&A. The purpose of sign language teaching is to help people who do not know sign language to learn it; sign language recognition can help people who do not know sign language to understand the meaning of sign language through the app; and online Q&A is a place for users to pitch their queries.

神奇平台

Magic app為聾啞人士而設計。在日常生活中，聾啞人士難以簡單地表達自己的所思所想，人們也經常無法理解他們所做的手語，大大影響了聾啞人士溝通與出行。因此，這個應用程式的誕生，就是為了讓不懂手語的人能利用此應用程式，明白每個手語的意思，從而和聾啞人士溝通。

這個應用程式運用 Pictoblox 及 Google AI teachable machine 來編程，應用程式內包含三個部分，分別是手語教學、手語識別及線上對話。手語教學的目的是幫助不認識手語的人學會手語；手語識別可以幫助不懂手語的人，透過這 App 來明白手語的意思；線上對話則是讓使用者表達疑問的地方。

Simply turn on Sign Language Recognition, point the camera at the sign gestures made by the deaf-mute person, the programme will make a sound to inform the user of the meaning of the sign language and display the corresponding text on the mobile phone.

Through the Magic app, everyone can read the 'voice' of the deaf-mute, gradually eliminating the barrier between the deaf-mute and others, helping them to integrate into society more easily, and become part of an inclusive society.

Comments from Judging Panel 評審委員會評語

This app is an effective way to help the public to communicate with the deaf-mute by making sign language understandable to the public. If the app continues to collect more pictures and videos, the sign language dictionary in the app will also be improved, which is a good start to promote an inclusive society.

人們只需打開手語識別，用鏡頭對準聾啞人士所做的手語，程式便會發出聲音，通知用家該手語的意思，並在手機上顯示相應的文字。

通過Magic app，大家都能讀懂聾啞人士的「聲音」，逐漸消除與聾啞人士之間的隔膜，助他們更容易融入社會，成為共融社會的一份子。

這個應用程式將手語變為一般人能夠理解的意思，有效協助大眾與聾啞人士溝通。只要繼續收集更多圖片和影片，程式裏的手語詞典也將會更加完善，是促進共融社會的一個好開始。

Student Innovation (Primary)

Bronze Award

學生創新 (小學) 銅獎

Hong Kong Baptist Convention Primary School 香港浸信會聯會小學
CHAN Ching On / LO Hilary 陳靖安 / 羅希琳



Go Green Recycling Machine

The 'Go Green Recycling Machine' and the 'Mobile App' are the two components of this system created to encourage the public to recycle waste. The 'Go Green Recycling Machine' uses VEX IQ robotics and AI lenses to identify the type of items (plastic bottles/aluminium cans/non-recyclable), and then opens the corresponding lids for the users to drop off the recyclable items. A light sensor inside the machine will emit a sound when it detects an item, and a one-time validation code will be displayed on the screen. Users can enter the verification code into the mobile app and accumulate points to redeem rewards. In addition, the distance sensor inside the recycling machine can detect how full the recycling bins are, and the mobile app will also display the status of all the recycling bins in real time.

「綠」續有賞回收機

「綠續有賞回收機」及「積分獎賞手機應用程式」兩部分組成了這個鼓勵大眾廢物回收再造的系統。「綠續有賞回收機」運用 VEX IQ 機械人及人工智能鏡頭來識別物品類別（膠樽 / 鋁罐 / 不可回收），然後打開相應的蓋供用家投放。機內的光度感應器感應到物件後，就會發出聲響提醒，然後熒幕會顯示一次性驗證碼。用戶可以在手機應用程式上輸入驗證碼，累積積分以兌換獎賞。除此之外，回收機內設有距離感應器，能夠偵測回收箱的滿載程度，手機也會同步顯示所有回收箱的狀態。

The objective of the 'Go Green Recycling Machine' is to:

- Increase the public's motivation to recycle and cultivate the habit of recycling.
- Slow down the rate of landfill saturation and reduce environmental pollution, greenhouse effect and global warming.
- Recycle any types of plastic bottles and aluminium cans, including plastic bottles without labels, to improve the Government's bottle-collecting machines.
- Educate the public on the benefits and importance of recycling through the green information in the app.

綠續有「賞」回收機的目標：

- 提高市民對回收的動力，培養回收習慣。
- 減慢堆填區飽和的速度，減輕污染環境、溫室效應和全球暖化的問題。
- 任何膠樽和鋁罐都可以被回收，包括無招紙膠樽，有助改善政府的入樽機。
- 透過應用程式內的環保資訊，教導市民環保回收的好處和重要性。



Comments from Judging Panel

評審委員會評語

This project presented a good concept of feasible ways to improve the existing recycling equipment. Students demonstrated excellent problem-solving skills by making good use of different IT tools to come up with creative solutions to the connectivity problems between the recycling machines and the supporting applications.

這個項目針對現有回收設備的不足之處，提出了可行的改善方法，概念不俗。就回收機和配套應用程式之間的連接問題，同學善用不同的IT工具，構思出具創意的解決方法，展現出優秀的解難能力。

Student Innovation (Primary)

Bronze Award

學生創新 (小學) 銅獎

Hong Kong Eng Clansman Association Wu Si Chong Memorial School
僑港伍氏宗親會伍時暢紀念學校

IP Tze Huen / TANG Cheuk Chun / WONG Sum Laam / CHAN Yu Ching
葉梓萱 / 鄧焯駿 / 黃心嵐 / 陳宇晴



"Bearier"- Intelligent Flood Barrier

In recent years, Hong Kong has been experiencing a series of extreme weather condition, and people are increasingly affected by heavy rainfall and flooding. To help the public effectively prevent disasters, this product enhances the performance of the existing water barrier by designing a water barrier that can automatically rise and fall in response to the real-time changes in water level. Users do not have to be present at the flood site, but can still effectively block the unpredictable flooding into the room, reducing the safety risk and property damage caused by flooding.

「洪出沒」！智能擋水板

香港近年接連出現極端天氣，市民受暴雨及洪水的影響日趨嚴重。為了幫助市民有效防災，這個產品能提升現時擋水板的效能，設計能因應實時水位變化而自動升降的擋水板。用家不用置身於現場，也可有效阻截變化莫測的洪水湧入室內，減少因洪水淹浸而帶來的安全風險和財物損失。

Product Functions:

1. Intelligent flood barrier can sense the water level outside the building in real time and adjust the height automatically, which can simplify the process of disaster relief and prevent users from encountering dangers when manually setting up the flood barrier.
2. Intelligent flood barrier has a curved top, which is tested to be the best water barrier shape.
3. Intelligent Flood Barrier can be installed under the ground for easy access and aesthetics purposes.

Product Highlights:

1. Simplify the process of disaster relief: the Government does not need to send people to help victims set up water barriers whenever floods come.
2. High value of technology application: can be installed in various places such as homes, shops and MTR stations.
3. Contribute to the development of Hong Kong as a smart city: water level sensors can measure water level more accurately than traditional hydrological scales. The water level data collected can be used to analyse river conditions and to plan for flood prevention, irrigation, and water supply.

裝置功能：

1. 智能擋水板能實時感測建築物外的水位，並自動調節高度，能簡化救災過程，並避免使用者在人手設置擋水板時遇上危險。
2. 智能擋水板呈頂部彎曲狀，經測試後為最佳擋水形狀。
3. 智能擋水板可安裝於地底，方便出入又美觀。

產品優點：

1. 簡化救災過程：政府不用每逢洪水來臨都要派人協助災民設置擋水板。
2. 科技應用的價值高：能設於家居、商店及地鐵站等多個地方。
3. 促進香港的智慧城市發展：水位感測器較傳統水文尺更能精準測量水位。收集所得的水位數據可用作分析河流狀況，規劃防洪、灌溉、供水等設備。



Comments from Judging Panel 評審委員會評語

This project focuses on the actual difficulties encountered by the public during rainstorms and floods. The research spirit of this project should be appreciated as it involves site visits and interviews, as well as the construction of a clear model to find out the parameters that should be used in the production of an automated flood barrier through repeated wave simulations. Afterwards, students can think about how to install the flood barrier in the real environment, so that the model can be turned into a practical product.

這個項目針對市民在暴雨及洪水時實際遇見到困難，進行了實地考察和訪問，並建造了清晰的模型，通過多次的海浪模擬，找出製作自動擋水板應使用的參數資料，其研究精神值得欣賞。之後可思考在實際環境下該如何安裝擋水板，將模型變為實用的產品。

Student Innovation (Primary) Certificate of Merit 學生創新 (小學) 優異證書

C.&M.A. Chui Chak Lam Memorial School 基督教宣道會徐澤林紀念小學

TANG Hei Yin / SHEK Yee Shuen Scarlett / CHAN Man Chun / WONG Lok Sum

鄧希妍 / 石鈺鏇 / 陳文縉 / 黃樂心



Good Partner

According to the data released by the Hong Kong Housing Authority and the Housing Department in 2023, about 14,000 accidents occurred on construction sites from 2019 to 2023, which were mostly caused by the lack of proper safety measures. Therefore, the invention of the 'Good Partner' aims to protect workers from injuries and reduce accidents at construction sites.

築君安好

根據香港房屋委員會及房屋署在2023年公布的數據，2019至2023年期間，工地發生了約14,000次意外，其中很多都是因為沒有做好安全措施而造成的。因此，發明「工人智能安全帽」的目的便是令工人在工地免受傷害，減少意外。

Product Functions:

1. There is a detection device on the cap rope to check whether the worker's helmet rope is properly tied. If the helmet is not properly fitted, the lamp will light up and produce an audible warning.
2. Use motion sensor to determine whether the worker will fall or faint.
3. An emergency help button is provided so that if a worker feels sick or has an accident, he/she can press the button directly to notify the supervisor to come and help.
4. If there any of the above emergencies happen, or if the helmet has not been worn correctly for a period of time, a message will be sent to the supervisor through the IOT for follow-up.

Product Highlights:

1. Workers do not need to learn how to use it, just fasten the strap as they do with a normal helmet and the system will operate automatically.
2. The device is very lightweight and does not pose a weight burden on the wearer.
3. The emergency button is in the centre of the round micro-computer and can be easily reached by the worker.
4. In case of emergency, safety officers can provide quick support to enhance work efficiency.

裝置功能：

1. 帽繩上有偵測裝置，檢查工人的安全帽繩有否綁好。如沒有正確佩戴，安全帽會亮燈並發聲作提醒。
2. 利用運動傳感器來判斷到工人會否跌倒或暈倒。
3. 設有緊急求助按鈕，如工人感到不適或出現意外，可直接按下按鈕，通知主管到場協助。
4. 如有以上的緊急狀況，或持續一段時間沒有正確佩戴安全帽，會透過物聯網發送訊息通知主管跟進。

產品優點：

1. 工人無需特別學習使用方法，如平常安全帽般扣好帶子，系統就會自動運作。
2. 設備十分輕巧，不會對配戴的工人構成重量負擔。
3. 緊急求助按鈕設於圓形微電腦的正中央，工人能輕易觸及。
4. 如遇緊急情況，安全主任能快速支援，提升工作效益。



Student Innovation (Senior Secondary) Gold Award 學生創新 (高中) 金獎

ELCHK Lutheran Secondary School 基督教香港信義會信義中學
MOCHIZUKI Ken 望月謙



A-EYE AI visual impaired shopping assistant

Shopping, including product identification, payment and navigation, is a great challenge for the visually impaired persons. They often have to rely on the assistance of other people, which creates tremendous psychological pressure for them. Therefore, this project employs both hardware and software technologies to assist the visually impaired to shop independently.

In terms of hardware, it uses a microcomputer, wireless charging and wireless image transfer technology. In terms of software, it uses the latest image recognition technology, self-developed analogue sound navigation and voice recognition technology, additionally providing a mobile app version. The device or app will capture and process images in real time through the front camera, use image recognition models to identify objects, and provide voice navigation to help users find the target area.

人工智能視障人士購物助理

購物，包括產品識別、付款和導航，對視障人士來說是一個很大的挑戰，往往需要依靠其他人的協助，這對他們造成巨大的心理壓力。因此，這個項目同時採用了硬件和軟件技術，協助視障人士完全自主購物。

在硬件方面，它使用了微型電腦、無線充電和無線圖像傳輸技術。在軟件方面，它採用了最新的圖像識別技術、自主研發的模擬音效導航和語音識別技術，並提供手機應用程式版本。此裝置或應用程式會通過前置攝像頭，即時捕捉和處理圖像，利用圖像識別模型識別物品，並提供語音導航，幫助用戶找到目標區域。

After putting on the device, the visually impaired person can use gestures to activate the voice recognition function of the device. Simply by telling the device the product they want to buy or the area they want to go to, the device will lead the user to the target area through the voice and analogue sound system, and to find out where the target product is located at through the orientation of the finger. At checkout, it can also recognise the number of cash held by the user and assist the visually impaired to make purchases on their own. The user can cancel or change the target product, or search for multiple products at the same time, and the device will also suggest the user to buy the more cost-effective products.

視障人士佩戴裝置後，便可以透過手勢喚醒裝置的語音識別功能，只需告訴裝置想購買的商品或者想前往的區域，裝置便會透過語音和模擬音效系統，帶領使用者前往目標區域，並且透過手指的方位，找出目標商品所在的位置。在結帳時也可以識別用家持有的鈔票數目，以協助視障人士自主購物。用家可以取消或更改目標商品，也可以同時尋找多項商品，裝置也會建議用家購買性價比較高商品。

A-EYE FAMILY



A-EYE GEN1

規格 | Detail
ESP-32 (Uly Go) 130° Camera
1000 mah Battery

重量 | Weight : 90g
尺寸 | Size : 5 x 9 x 3 cm2
續航力 | Battery : 2-3 hrs
成本 | Cost : <250krd





A-EYE GEN2

規格 | Detail
Raspberry Zero 2 W 110° Camera
1000 mah Battery

重量 | Weight : 60g
尺寸 | Size : 3.5 x 11 x 2.7 cm2
續航力 | Battery : 2-3 hrs
成本 | Cost : <200krd





A-EYE SLIM

Smaller

規格 | Detail
Raspberry Zero 2 W 110° Camera

重量 | Weight : 50g
尺寸 | Size : 3.5 x 8 x 2 cm2
續航力 | Battery : —
成本 | Cost : <150krd





A-EYE MOBILE

A-EYE on mobile

規格 | Detail
Mobile Application

重量 | Weight : —
尺寸 | Size : —
續航力 | Battery : —
成本 | Cost : 0



Comments from Judging Panel

評審委員會評語

The producer of this project is socially responsible, understands the core issues of society and the target audience, and has the potential to be a scientist in terms of thinking, execution and interpretation. The multi-platform concept of using a physical device or installing an app on a mobile phone is appreciated. This invention is very useful in addressing the practical social and lifestyle needs of the visually impaired. If the AI can be trained to collect more data for analysis, it will have huge market potential.

這個項目的製作者富有社會責任感，非常理解社會和目標對象的核心問題，從思路、執行到演繹都具備科學家潛質。用家可以按自己的需要，使用實體裝置，或在手機上安裝應用程式，多平台的概念也值得欣賞。這項發明能協助解決視障人士實際的社會和生活需求，非常實用。若能訓練AI收集更多數據分析，將會擁有巨大的市場潛力。

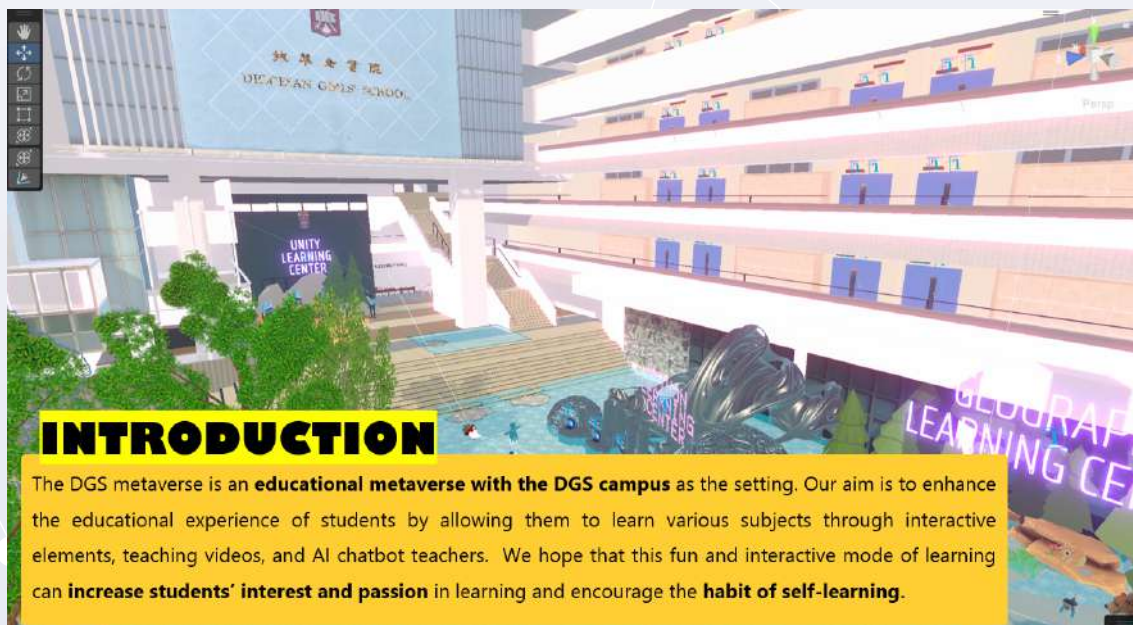
Student Innovation (Senior Secondary)

Silver Award

學生創新 (高中) 銀獎

Diocesan Girls' School 拔萃女書院

TSANG Evelyn Wai Ning / CHAN Tsz Nam / LAU Sin Sze Zoe / WANG Cindy Hing Yu
曾慧寧 / 陳芷楠 / 劉善思 / 王馨宇



DGS Metaverse

This is an educational meta-universe based on Diocesan Girls' School, designed to provide an immersive educational experience. The meta-universe combines AI dialogues, videos and interactive elements to teach students about Python programming, the Unity game engine and other subject knowledge. The meta-universe is built in the Unity engine and written in C# to create realistic and practical scenarios. By touching different media, students can watch instructional videos or read text to learn about the subjects. The AI in the meta-universe can answer students' questions in different knowledge areas and help them solve problems instantly. In addition, different virtual facilities can interact with students, making the learning process dynamic and interesting, stimulating their passion for learning.

DGS Metaverse has four main functions:

Python Learning Centre: Provides a step-by-step journey into Python programming. Students can access comprehensive learning materials, video tutorials, code samples and exercises, and receive personalised guidance from AI tutors powered by the ChatGPT API.

拔萃女書院教育元宇宙

這是一個以拔萃女書院為基礎背景的教育元宇宙，旨在提供身歷其境的教育體驗。元宇宙融合了人工智能對話、影片教學以及互動式元素，教導學生Python編程、Unity遊戲引擎及更多科目內容。該元宇宙由Unity引擎製成，並利用C#編寫，創造出真實而實用的場景。學生通過觸碰不同的媒介，能夠觀賞教學影片或閱讀文字資料，了解科目相關的知識。元宇宙中的人工智能可以解答學生在不同知識領域的問題，即時幫助他們解決難題。此外，不同的虛擬設施也能與學生互動，使學習過程變得生動有趣，激發他們的學習熱情。

元宇宙現有四項主要功能：

Python學習中心：提供循序漸進的Python程式設計學習旅程。學生可以使用全面的學習資料、視訊教學、程式碼範例和練習，並接受由ChatGPT API驅動的AI教師提供的個人化指導。

Unity Learning Centre: Offers resources for learning game mechanics, C# scripting, asset creation, and environment building. Students learn to create parkour games by watching video tutorials and examples, while AI instructors answer questions and provide guidance.

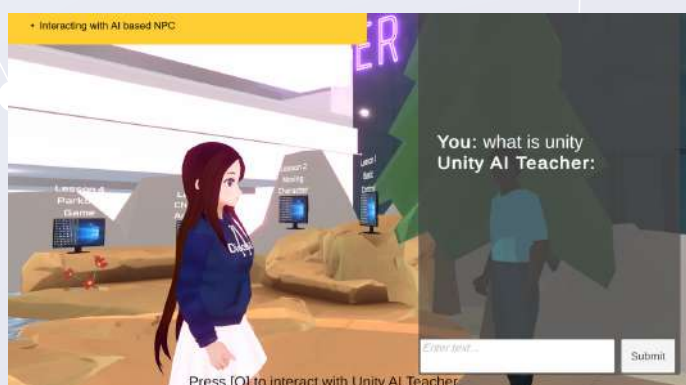
Geography Learning Centre: A virtual desert environment is set up to demonstrate the effects of desertification. Students can explore the virtual desert and learn about the consequences of deforestation, which can raise their awareness of environmental protection.

Campus Customisation: Students can submit their own creations to customise the decoration of the DGS campus. This not only encourages students to express their creativity and individuality by creating a more appealing learning environment, but also provides students with hands-on experience in Unity environmental design.

Unity 學習中心：提供學習遊戲機制、C# 腳本、資產製作和環境建設的資源。學生透過觀看影片教學與實例，學習製作跑酷遊戲，AI 教師也會回答問題並給予指導。

地理學習中心：設有虛擬沙漠環境，直觀展示沙漠化前後的影響。學生可以探索虛擬沙漠，了解砍伐森林的後果，提高環境保護意識。

校園自訂功能：學生可提交自己的創作，為 DGS 校園自訂裝飾。這不但鼓勵學生表達自己的創意和個性，創造更吸引人的學習環境，也為學生提供了 Unity 環境設計的實際經驗。



Comments from Judging Panel 評審委員會評語

This project has successfully transformed the Diocesan Girls' School campus into a virtual world, providing an optional, fun way for students to learn. If it can be expanded with more interesting subjects and improved with features such as picture insertion, voice system, etc., it will have the potential to compete in the market.

這個項目成功將拔萃女書院的校園轉換到虛擬世界中，為學生提供了一種可選的，有趣的學習方式。如果可以擴展更多有趣的科目，並完善插入圖片、語音系統等功能，將能夠擁有面對市場競爭的潛力。

Student Innovation (Senior Secondary) Certificate of Merit 學生創新 (高中) 優異證書

CNEC Christian College 中華傳道會安柱中學
TSUI Chi Tang 徐志騰

Our Solution: Ambu Flow

Reward Function:

MPRCS(Max Pressure with Remaining Capacity of Surrounding Lane) (eq.1) was proposed in this project. Taking surround lanes into consideration, avoiding the phenomenon that vehicles cannot completely pass the intersection due to limited outgoing lane capacity.

$$P_i = N_{in} * (1 - W_f * \frac{C_f}{Cap_f} - W_l * \frac{C_l}{Cap_l} - W_r * \frac{C_r}{Cap_r})$$

Eq.1 Calculation of Pressure

- P_i represents the pressure of the traffic movement i
- N_{in} represents the number of vehicles on the incoming lane
- $W_{f,l,r}$ represents the weight of forward, left and right direction
- $C_{f,l,r}$ represents the number of vehicles on the outgoing forward, left and right lane
- $Cap_{f,l,r}$ represents the maximum capacity of the outgoing lane forward, left and right

We aim for the lowest overall pressure inside the junction, hence the total reward R for an action could be represent by:

$$R = \sum -P_i$$

Eq.2 Calculation of Reward

DQN:

- Aims to **maximize long-term cumulative rewards** (e.g. increasing the overall average speed of cars)
- Handles Large State Spaces/ Multiple Observation Data (e.g. number of cars at each junction throughout the entire road network)

$$Q^{new}(S_t, A_t) = (1 - \alpha) * Q(S_t, A_t) + \alpha * (R_{t+1} + \gamma * max Q(S_{t+1}, A_{t+1}))$$

Eq.3 Q-learning function

LLM (Large Language Models):

Extracting useful information from ambulance calls

Input:

Patient: Hi, I need an ambulance. I'm experiencing sudden and severe shortness of breath, chest pain, and I'm coughing up blood. I'm worried it might be a pulmonary embolism.

Output:

```
{
  "symptoms": "Shortness of breath, chest pain, coughing up blood",
  "disease": "Possible pulmonary embolism",
  "severity": 10,
  "golden_time": 10
}
```

Car Recognition Method:

Using **RFID(Radio Frequency Identification)** for car counting + Ambulance detection on roads.

RFID Traffic Control System (MPRCS) for Ambulance

Traffic congestion is not only a waste of time and productivity, but also has a negative impact on the environment.

MPRCS can avoid the problem of vehicles failing to cross the intersection completely due to the limited capacity of the exit lanes. MPRCS also has a special green light priority feature for emergency vehicles. Using RFID as the vehicle counting method combined with the MPRCS algorithm, the intelligent traffic light system hopes to reduce traffic congestion and shorten the arrival time of ambulances and other emergency vehicles by using a machine learning model to vary the length and pattern of the traffic lights.

基於無線射頻協助救護車的智慧交通控制系統 (MPRCS)

交通擁塞不僅浪費時間與生產力，也會對環境造成負面影響。

MPRCS能夠避免車輛因為出口車道容量有限，無法完全通過十字路口的問題，還特別設置了對緊急車輛的綠燈優先通行功能。此智慧型交通燈系統利用 RFID 作為車輛計數方法，並結合 MPRCS 演算法，希望透過機器學習模型改變交通燈的長度與模式，以減緩交通擁塞，並縮短救護車與其他緊急車輛的抵達時間。

The Intelligent Traffic Signal System was tested using two simulated maps, namely the Sha Tin New Town and the 3x3 Grid Map. The test results show that the system has made significant improvements in reducing traffic congestion, as well as shortening the arrival time of ambulances and general vehicles. The average vehicle travelling speed increased by 60.7% and travelling time reduced by 38.7%. The average travelling time of an ambulance on a 3-kilometre journey was reduced by 62.9%.

By improving traffic flow and minimising delays at junctions, the system effectively mitigates the economic losses, carbon emissions and potential loss of life associated with traffic congestion. In addition, the system's focus on prioritising emergency vehicles ensures that vital medical assistance reaches those in need faster.

智慧型交通燈系統已在沙田新市鎮及 3x3 網格地圖兩個模擬地圖進行測試。測試結果顯示，該系統在減少交通擁塞、縮短救護車與一般車輛抵達時間方面有顯著改善。車輛平均行駛速度提高了60.7%、行駛時間減少了38.7%。救護車在3公里行程中的平均行駛時間減少62.9%。

透過改善交通流量，並將路口的延遲時間降至最低，此系統可有效緩解與交通擁塞相關的經濟損失、碳排放以及減少潛在的生命損失。此外，此系統注重緊急車輛的優先順序，可確保重要的醫療援助能夠更快地送達至有需要的人。



	Overall Throughput	Average Number of Cars in Network	Average Speed	Average Travelling Time (seconds)
Fixed Timing	15292	303	31.39km/h	250.94s
RFID (Previous Work)	15735	211	45.94km/h	176.73s
PD Light	16844	178	49.83km/h	170.56s
MPRCS (OURS)	16813	154	50.45km/h	153.77s

Table1: Performance In Handling Traffic

	To Tai Chung Kiu Road	To Wo Che Shopping
Fixed Timing	351.9s (5.9min)	320.5s (5.3min)
RFID (Previous Work)	161.2s (2.7min)	169.2s (2.8min)
PD light	202.3s (3.4min)	223.8s (3.7min)
MPRCS (OURS)	145.3s (2.4min)	149.5s (2.5min)

Table2: Average Travelling time of ambulance

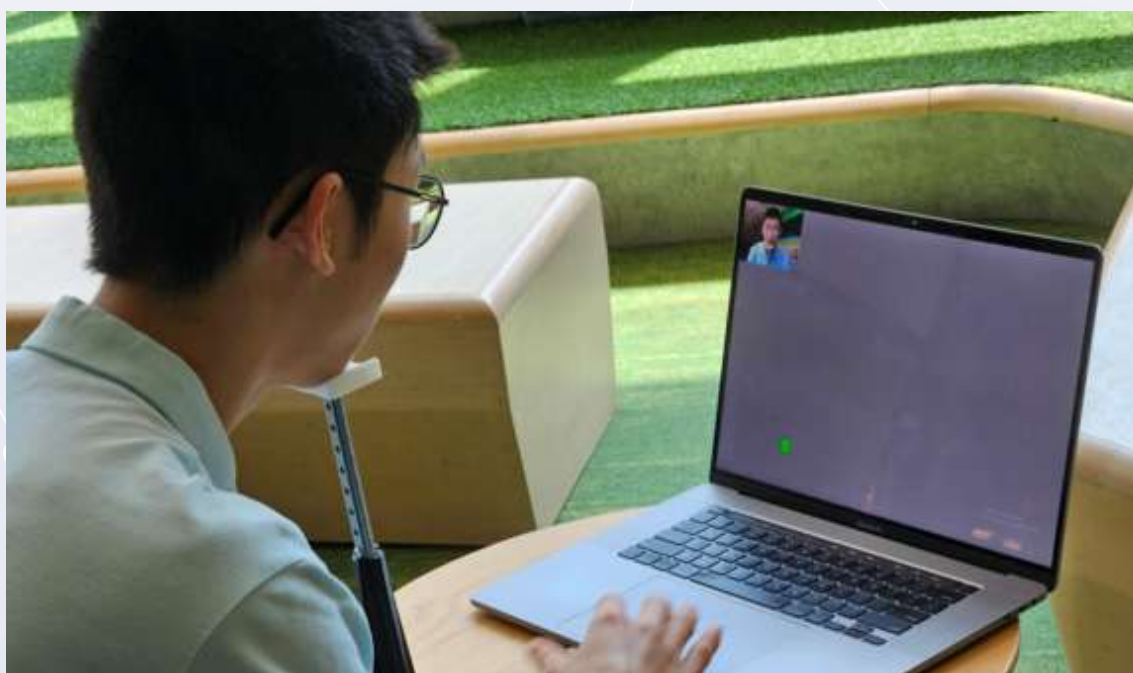
Current Car Counting/Recognizing:			
	RIFD	Camera	Inductive Loops
PROS	<ul style="list-style-type: none"> Relatively Cheap Robust & Stable Easy for installation 	<ul style="list-style-type: none"> Long Detection Range 	<ul style="list-style-type: none"> Stable
CONS	<ul style="list-style-type: none"> Relatively short detection range(10m-100m) 	<ul style="list-style-type: none"> Relatively Expensive Accuracy easily affected by weather Strict camera position required 	<ul style="list-style-type: none"> Poor Detection of Small Vehicles Requires reconstruction of roads

Student Innovation (Senior Secondary) Certificate of Merit 學生創新(高中)優異證書

Independent Schools Foundation Academy 弘立書院
Melbourne Grammer School

SUN Yuqi / LAU Kan Kenneth 孫宇琦 / 劉勲
Richard XU 許達宇



ALICE: Alzheimer's diagnosis and severity IndiCator based on Eye behaviour neural network classifier

In Hong Kong, up to 85% of people with Alzheimer's disease may not be able to receive appropriate care after diagnosis. Therefore, a way to diagnose Alzheimer's disease at an early stage is very important, which will enable more patients to take appropriate treatment or prevention before the symptoms start to affect their daily lives.

ALICE is an indicator based on eye behaviour neural network classifier designed to predict Alzheimer's disease through changes in a patient's eye behaviour. ALICE uses neural network technology to analyse many Alzheimer's patients' data to predict the likelihood and severity of Alzheimer's disease. It is an effective, remote, and non-invasive early screening test for Alzheimer's disease.

ALICE: 基於眼部行為神經網路分類器 的阿茲海默症診斷及嚴重程度指標

在香港，高達85%的阿茲海默症患者可能無法得到診斷後的適切護理。因此，在早期就能診斷阿茲海默症的方法極為重要，這可以使更多患者在症狀開始影響日常生活之前，採取適當的治療或預防。

ALICE是一款基於眼部行為的神經網路分類器，旨在透過患者眼部行為變化來預測阿茲海默症的軟體。ALICE利用神經網路技術，分析大量阿茲海默症患者的數據，從而預測患者罹患阿茲海默症的可能性和嚴重程度，是一種有效的，遠端非侵入性的阿茲海默症早期篩檢測試。

ALICE can be used anytime, anywhere, by anyone, with a device that has a camera and an Internet connection. To use ALICE as a predictive tool, users can simply browse the website and take a test that takes only five minutes. Immediately after the test, users will receive a detailed report of their performance on a variety of indicators. The report indicates the possibility of the user having developed Alzheimer's disease. If the user has already been diagnosed with Alzheimer's disease, ALICE can also indicate its severity through diagnostic tests. Patients can use this report to seek external professional medical help if necessary.

只要有一台具備攝影及網絡連接功能的裝置，任何人都可以隨時隨地使用ALICE。若要使用ALICE作為預測工具，使用者只需瀏覽網站，並進行僅5分鐘的測試。測試結束後，使用者會立即獲得一份詳細報告，其中包括他們在各種指標上的表現。報告中會指出使用者罹患阿茲海默症的可能性。如果使用者已經被診斷出患有阿氏症，ALICE也可以透過診斷測試，指出其嚴重程度。患者可根據此報告，在需要時尋求外部專業的醫療協助。



Accessible

ALICE is accessible on any device with internet access and a camera, e.g. smart phone, tablet, laptop



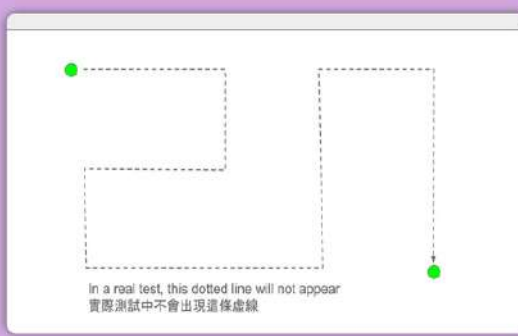
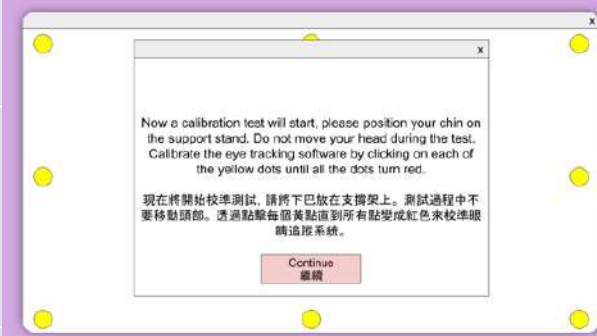
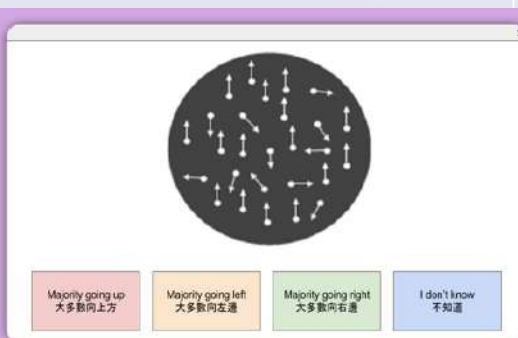
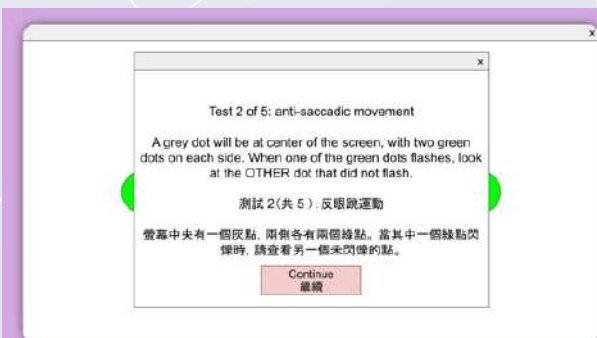
Accurate

ALICE can produce results instantly after testing, and each test will require less than 5 minutes



Accelerated

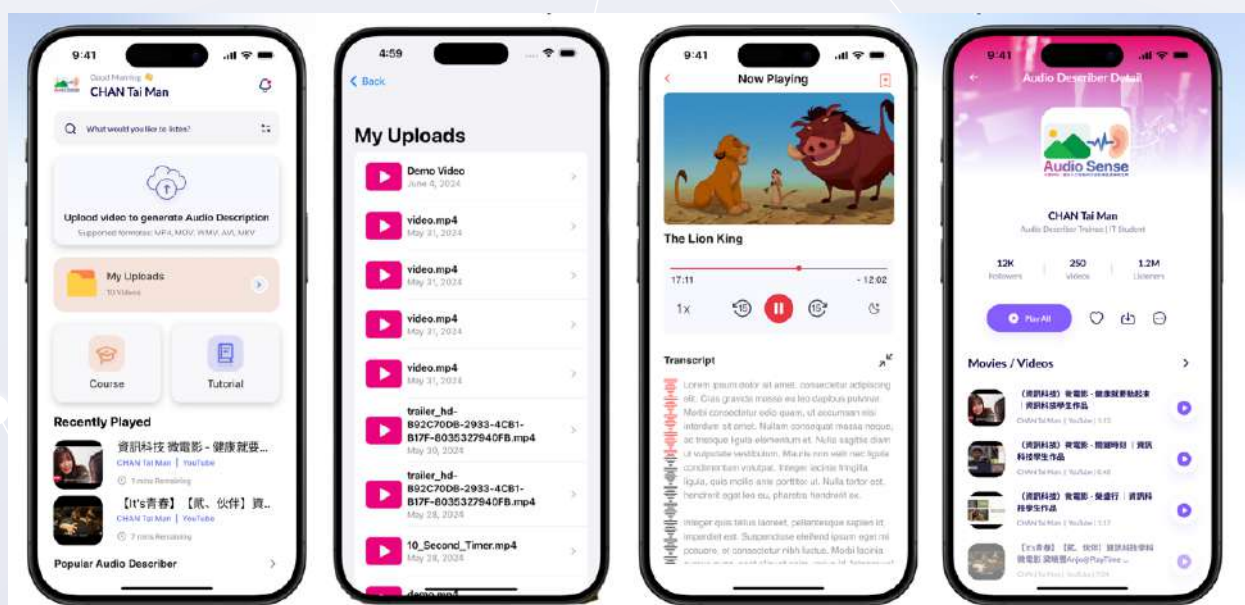
ALICE can track disease progression over time to help caregivers and doctors assess elderly long-term



Student Innovation (Higher Education) Gold Award 學生創新 (大專及高等教育) 金獎

Hong Kong Institute of Information Technology,
Institute of Vocational Education (Sha Tin)
香港資訊科技學院位於香港專業教育學院 (沙田)

TSANG Shun Tin / HO Lok Yin / HO Cheuk Hin / CHAN Ka Wing
曾順天 / 何樂言 / 何卓軒 / 陳嘉穎



AudioSense

AudioSense is an AI-driven audio description platform designed to streamline the creation of audio descriptions for visually impaired individuals. The system leverages cutting-edge AI technologies, including AI Video Accessibility Assessment, AI Movie Scene Analysis, and AI Script Composition Assistance, to utilize machine learning models trained on diverse datasets, such as online videos, news videos, and audio-described videos, with the intention to provide high-quality descriptive audio. Additionally, AudioSense integrates cloud infrastructure for scalable and efficient processing, and provides user-friendly mobile and web application interfaces that support seamless video uploading and script editing. This project also incorporates accessibility features, including voice control and compatibility with Siri on iOS devices, enhancing inclusivity and ease of use.

以聲知形——基於人工智能的口述影像生產輔助工具

以聲知形是一款基於人工智能的口述影像生產輔助工具，旨在簡化口述影像的製作過程。以聲知形基於人工智能的影片分析、腳本創作輔助和文本轉語音轉換功能，利用在多樣化數據集上訓練的機器學習模型，保證高質量的口述影像描述。此外，以聲知形集成了雲端基礎設施，以實現可擴展和高效的處理，並提供用戶友好的移動和網絡應用界面，支持無縫的影片上傳和腳本編輯。項目還融合了無障礙功能，包括語音控制並與iOS設備上的Siri兼容，提高了包容性和易用性。

Main functions:

1. AI Video Accessibility Evaluation: Evaluates the accessibility of video content and checks for sensitive information such as violent or explicit content.
2. AI Movie Scene Analysis: Automatically breaks down and organises scene information (spatial layout, character expressions, actions, etc.) to ensure fast and accurate results.
3. AI Script Writing Assistance: Helps narrators generate accurate and effective scripts for audio description, speeding up the scripting process to increase efficiency.
4. AI Voice Video Generation: Combines voice and graphic technologies which supports multiple languages and voice styles to ensure clear and natural narration. In addition, the platform includes a voice overlay check to ensure that background sounds and voice descriptions do not interfere with each other.

There are 285 million blind or visually impaired persons in the world, with 200,000 visually impaired persons in Hong Kong at present, creating a huge demand for audio description services. AudioSense enables users to upload, play, edit videos and scripts easily to enhance the viewing experience of the visually impaired, allowing visually impaired persons to access and appreciate visual content, promoting social inclusion and equal access to information, so that everyone, regardless of their visual ability, can enjoy and participate in the rich world of visual media.



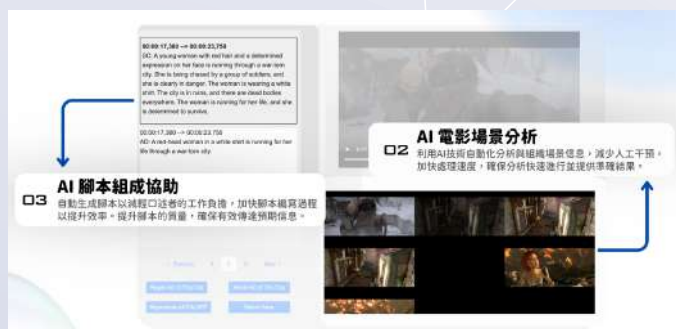
Comments from Judging Panel 評審委員會評語

This project is practical and innovative. The automatic video to speech conversion function makes good use of AI technology, and the product is quite complete, offering practical and quick help to the visually impaired, bringing about a positive impact on society. Similar concepts can be extended to video surveillance, facility management, gaming, or the school classroom, which target a wide market and have good business potential. The impact will be further enhanced if following updates can better assist the visually impaired to produce their own videos.

以聲知形的主要功能包括：

1. AI視訊無障礙評估：可評估視訊內容的無障礙程度，並檢查是否有暴力或露骨內容等敏感資訊。
2. AI電影場景分析：自動分解和組織場景訊息（空間佈景、人物表情、動作等），確保快速準確地提供結果。
3. AI腳本撰寫輔助：協助口述者生成精確有效的語音說明腳本，加快腳本編寫過程，以提升效率。
4. AI語音影片生成：結合語音和圖像技術，支援多種語言和語音風格，確保旁白清晰自然。此外，該平台還包括語音重疊檢查，以確保背景聲音和語音描述不會相互干擾。

全球有2.85億失明或視障人士，單在香港就有20萬視障人士，對口述影像服務有龐大需求。以聲知形令使用者能輕鬆上傳、播放及編輯影片與腳本，提升視障人士的觀賞體驗，讓視障人士也能存取和欣賞視覺內容，促進社會包容性和資訊的平等存取，不論其視覺能力如何，讓每個人都能享受並參與豐富的視覺媒體世界。



這個項目實用且具創意，影片自動轉換語音功能善用AI技術，產品功能頗為完善，能為視障人士帶來實際和快速的幫助，並對社會造成正面影響。相似的概念往後也可拓展至監控影像、設備管理、遊戲或學校課堂上，擁有廣闊的市場和良好的商業潛力。如後續更新裏能更好地協助視障人士自行製作影片，將能夠進一步擴大影響力。

Student Innovation (Higher Education) Silver Award

學生創新 (大專及高等教育) 銀獎

Hong Kong University of Science and Technology 香港科技大學

LEE Cheuk Sum / SO Ho Mang Marcus / WONG Ho Leong 李焯森 / 蘇穎萌 / 黃皓亮

<https://handstalk.framer.website/>



HandsTalk Website

AI-Driven Real Time Sign Language Translate App **HandsTalk**

AI-Driven Real Time Sign Language Translate App – HandsTalk

The World Health Organisation (WHO) recognises that more than 5% of the world's population needs rehabilitation for hearing impairment. In Hong Kong, there is only one sign language interpreter for every 3,000 deaf-mute people, and the demand for real-time sign language interpreting services is very high.

HandsTalk is an AI-powered real-time sign language translation mobile communication app designed to remove communication barriers for sign language users, allowing them to communicate directly without intermediaries and without the need for any special device. The app seamlessly translates sign language into English using advanced AI models, computer vision technology and generative AI. Users can use it in real-time scenarios, video conversations, and more.

For sign language translation, HandsTalk has designed a new sentence completion feature that involves precise word selection to help compile lists of words and phrases. The application also recognises different gestures such as 'question mark', 'space' and 'delete' to enhance the flexibility of the generated sentences. The generative AI then creates coherent sentences from the translated words and phrases.

基於人工智能的即時手語翻譯應用程式——手語通

世界衛生組織確認全球超過 5% 的人口需要聽力障礙復健。在香港，每 3,000 名聾啞人士才有一名手語翻譯員，對即時手語翻譯服務的需求相當殷切。

HandsTalk 是一個透過 AI 驅動的即時手語翻譯的手機通訊應用程式，旨在消除手語使用者的溝通障礙，讓手語使用者無需使用任何特殊裝置，也可以在沒有中介的情況下直接溝通。這個應用程式利用先進的 AI 模型、電腦視覺技術和生成式 AI，無縫地將手語翻譯成英語。使用者可以在即時場景、視頻通話等情境下使用。

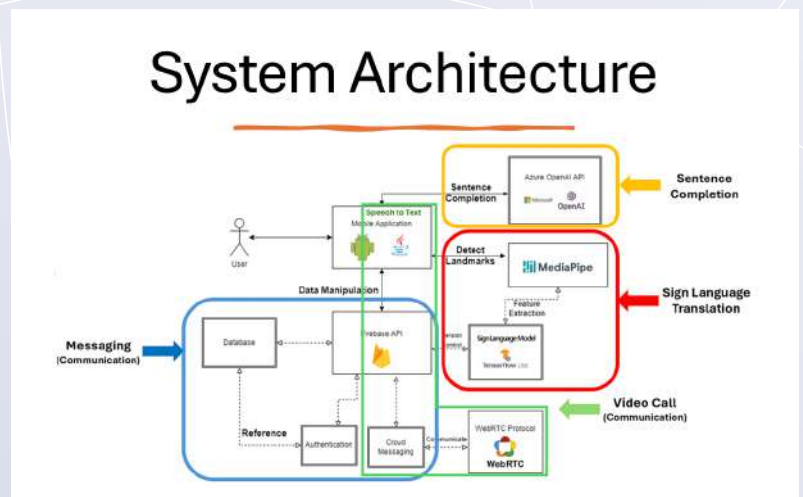
針對手語翻譯，HandsTalk 設計了一個新穎的句子完成功能，涉及精確的單字選擇，以協助編寫單字和短語清單。此應用也能辨認不同的指示手勢，例如「問號」、「空格」和「刪除」，增強生成句子的靈活性。之後，生成式 AI 會從翻譯的單字和短語造出連貫的句子。這個過程通常不超過 2 秒鐘，相當於傳送文字或語音訊息。此方法

HandsTalk's sign language translation can be used face-to-face in real time or during a video call.

- In the future, this method can be extended to any type and variation of sign languages as long as a high-quality dataset is available. In addition, users can also access sign language videos and images in the application for demonstration and learning purposes, and evaluate their progress using the sign language translation feature.

HandsTalk的手語翻譯可面對面即時使用，也可在視訊通話時使用。

- 未來，只要有高品質的資料集，此方法可擴展至任何類型和語言的手語。除此之外，使用者也可以在應用程式中存取手語影片和圖片，以進行示範和學習，並使用手語翻譯功能評估自己的進度。



這個項目將AI模型和科技使用在非常實用的範疇上，對核心用戶有充足認識，考慮到實際使用上的使用性和私隱問題，如果能持續開發不同的語言如廣東話和普通話，加入手語教學等功能，並探索更多的商業模式，將可以協助創造共融社會。

Student Innovation (Higher Education) Bronze Award

學生創新 (大專及高等教育) 銅獎

The Hong Kong Polytechnic University 香港理工大學

YEUNG Kwan Yu / SADMAN Sakib Rabbani

楊鈞羽

<https://www.joinpaypilot.com>



PayPilot Group Limited

The two main functions:

1. Find the Best Way to Pay:

PayPilot intelligently analyses user's spending patterns to recommend the most rewarding credit card for each transaction. If users do not have the optimal card, the app facilitates easy applications, ensuring they always get the best deals. By using the payment discount, consumers can save money.

2. Round-up Bills for Investments:

This feature rounds up users' everyday transactions to the nearest dollar, investing the spare change into various financial portfolios. This effortless micro-investment strategy encourages users to save and grow their wealth through daily activities. A micro-investment strategy is not a one-off investment, lowering existing barriers to investing while encouraging ongoing savings and investment, which makes financial education and wealth accumulation easy and comfortable.

付款導航

付款導航的兩大主要功能為：

1. 付款方式比較：

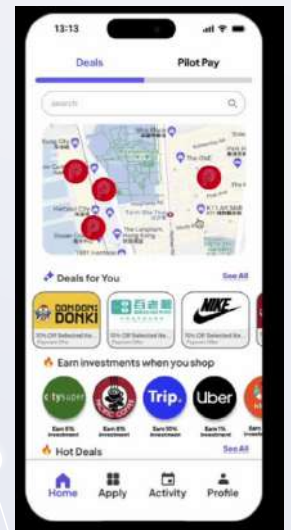
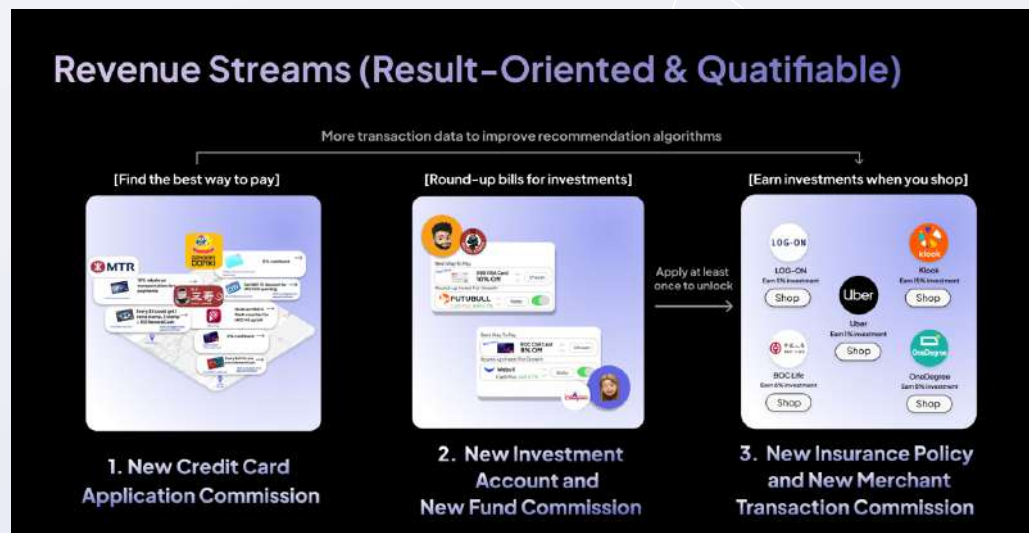
PayPilot 會智慧地分析使用者的消費模式，幫助消費者搜尋各商戶中的付款優惠，針對每筆交易，建議最好的付款方式或最優惠的信用卡。如果使用者沒有最佳的信用卡，該應用程式可協助使用者輕鬆申請，確保他們獲得最佳優惠。透過使用付款優惠，消費者可節省金錢。

2. 日常消費微投資：

PayPilot可將使用者的日常交易金額按四捨五入的原則，計算到最接近的十位數，並將零錢投資到現金投資帳戶。使用者可透過日常活動來儲蓄和增加財富，提早享受穩定的財務成長與複利效應。微投資策略並非一次性投資，既降低了現有的投資障礙，又可鼓勵持續的儲蓄與投資，讓理財教育與財富累積變得輕鬆自在。

PayPilot obtains payment transaction APIs from banks to ensure accurate and up-to-date credit card transaction information. PayPilot will regularly update the app with new features and enhancements based on user feedback.

PayPilot 從銀行獲取支付交易 API，確保提供準確度和接收最新的信用卡交易資訊，並將根據使用者反饋定期更新應用程式，提供新功能和改進。



Comments from Judging Panel

評審委員會評語

The smart payment method constructed in this project is a good idea for solving the common problems of price comparison and excessive coins in daily life. The application is technically excellent, the business plan is comprehensive and has the potential to open up a wide market if more measures to protect user privacy are implemented.

這個項目所構建的智能付款方法，為解決日常生活中常見的價格比較，以及零錢太多的問題，提出一個良好的構想。應用程式在技術上非常出色，商業計劃上也考量全面，如果可以考慮開發更多保障使用者私隱的措施，將有潛力開拓廣闊的市場。

Student Innovation (Higher Education) Certificate of Merit

學生創新 (大專及高等教育) 優異證書

The Hong Kong University of Science and Technology 香港科技大學
The University of Hong Kong 香港大學

CHEUNG Pok To Jason 張博滔 / CHAN Matthew 陳柏衡 / NIGAM Kaustubh /
ABRAHAM Jose Christian

<https://www.qualifyhk.com>



QualiFly Education - AI Tutor for Quality Education

Due to a lack of educational resources, traditional education in Asia struggles to meet individual learning needs and diversity.

QualiFly addresses the UN's Sustainable Development Goal 4 - Quality Education, developed AI tutors for grammar and writing, and partnered with about 20 schools and NGOs to help over 2,000 students learn better. QualiFly initially focuses on English language learning in primary schools, with plans to expand to other age groups, curricula, and subjects.

Q-Grammar (Developed in 2022):

To achieve personalised education, students on the platform would receive questions personally tailored by AI based on their real time performance. The AI tutor would explain the solution to students, track their past mistakes, in order to help them do revisions based on their weaknesses. The AI also generate real-time performance reports for parents to understand their children's situation.

飛昇教育——AI 導師成就優質教育

由於教學資源匱乏，亞洲的傳統教育難以滿足個別學習需求和多樣性。

QualiFly針對聯合國的可持續發展目標 4 ——優質教育，為語法和寫作開發 AI 導師，並與約20所學校和非政府組織合作，幫助超過2,000名學生更好地學習。QualiFly初步專注於小學英語學習，並計劃擴展到其他年齡組、課程和學科。

Q-Grammar (2022 年開發)：

為了實現個人化教育，平台上的學生會收到人工智能根據其即時表現量身定製的題目。人工智能導師會向學生解釋答案，並追蹤他們過去的錯誤，以幫助他們根據自己的弱點進行複習。人工智能還會生成即時的成績報告，讓家長瞭解孩子的情况。

Q-Writer (Developed in 2023):

This is a AI writing Tutor that teaches students how to write better essays. It adopts the famous educational framework, "Cognitive Process Theory of Writing (Flower & Hayes, 2004)": First, AI tutor will ask thought-provoking guiding questions to encourage students think about details of their writing. Then, based on the student's own ideas, the AI will generate an outline and provide thematic vocabularies for the students' reference, to teach them how to write better. Lastly, students receive personalised feedback provided by AI on Content, Language and Organisation (Based on EDB marking criteria), where they can understand how to improve next time.

QualiFly is developing AI tutors and teaching assistants to make education more personalised, efficient, and accessible. The product provides students with personalised exercises and real-time feedback based on the school curriculum, enabling learning anytime, anywhere. Teachers can customise lesson plans with AI-summarised insights into students' performance.

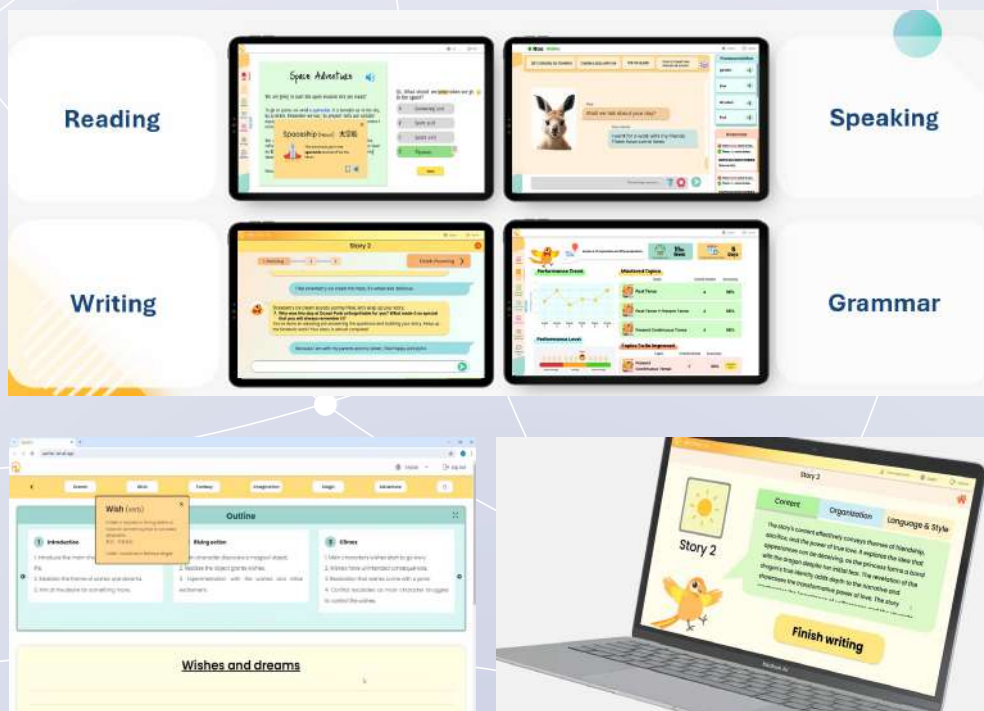
The product's vision for the future of education is to make teaching smarter and more efficient through the help of technology. Students will be able to receive personalised attention to their learning needs, achieving diversity in learning. Teachers will also be able to understand their students' situation in real time and make better plans for quality teaching.

Q-Writer (2023 年開發) :

這是一款寫作 AI Tutor，教導學生如何寫出更好的作文。它採用著名的教育架構「Cognitive Process Theory of Writing (Flower & Hayes, 2004)」：首先，AI 導師會提出發人深省的引導性問題，鼓勵學生思考寫作的細節。接着，根據學生自己的想法，人工智能會生成一個大綱，並提供主題詞彙供學生參考，教導他們如何寫得更好。最後，人工智能會就內容、語言和組織提供個人化的回饋（基於教育局的評分標準），讓學生明白下次如何改進。

QualiFly 正在開發 AI 導師和教學助理，使教育更加個性化、高效且易於獲得。此產品為學生提供個性化的練習和基於學校課程的即時反饋，實現隨時隨地學習。教師則可獲得 AI 總結的學生表現見解和定制的教學計劃。

此產品對未來教育的願景是透過科技的協助，讓教學更聰明、更有效率。學生能夠得到個人學習需求的照顧，體現學習的多樣性。教師也可以即時了解學生的情況，為優質教學做出更好的規劃。



Introduction of Leading Organiser 籌辦機構簡介



Established in 2000 with the support of the Quality Education Fund, Hong Kong Education City (EdCity) was incorporated in 2002 to become a wholly-owned company of the Government. Its mission is to enable better adaptation to change curriculum initiatives through technology. With a strong commitment to academic collaboration, resource sharing, and professional development, EdCity aims to empower educators, students, and parents in their pursuit of excellence in education.

香港教育城（教城）於二零零零年在優質教育基金資助下成立，並於二零零二年公司化，成為政府全資擁有的公司，致力推動學界利用資訊科技適切配合課程變革。教城堅持學術合作、資源共享和專業發展的承諾，旨在幫助教育工作者、學生和家長追求卓越的教育。

For more information, please visit
<https://www.edcity.hk>

有關教城的詳情，請瀏覽
<https://www.edcity.hk>

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Acknowledgement 鳴謝

Organising Committee 籌辦委員會

(按英文字母姓氏排列)
(In Alphabetical Surname Order)

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鍾禮邦先生 (中華基金中學)

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Mr Francis Hau Kan LAM (International Youth STEAM Education Association)

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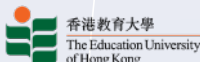


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